Superbug the Antibiotic Resistant

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ABSTRACT
Superbug is life threatening disease it resists or oppose the almost all antibiotic which are present in worldwide market. Superbug is bacteria which mutate naturally & forms bugs hence named as “superbug”. This is mainly due to misuse of antibiotic. There are mainly three types of bacteria like NDM-1, MRSA, & VRE.

INTRODUCTION
The cleaning work of CUPE (Canadian Union Of Public Employees) members may prove to be even more important in the near future as hospital management scramble to find solution to the spread of Superbug. Superbugs are infecting people in hospital & there is increasing evidence that improper hospital cleaning & inadequate staffing levels, due to contacting out & lay-offs are keys reasons for this problem. This short report is an initial attempt to document the problems related to Superbug & the increasing importance of cleaning & infection control work by CUPE members. A survey of the international literature on Superbugs lead.

UK scientists warn of worldwide spread of Superbug first let us know What is Superbug ?. Super bug is a bacteria of Antibiotic resistant organism as its is identified in 37 people who returned to the UK after undergoing surgery in India or Pakistan. This Superbug is as much powerful that it is resistant to most Powerful antibiotics so UK/ British scientists passed a warning that it will appear worldwide. Researchers already passing warning about this Super Bug as it will spreads more where the health system is low which is not having adequate medicines/ antibiotics.

A strain of bacteria that is resistant to one or more antibiotic(s) that would normally treat the bacteria. The increasing emergence of superbugs is a direct consequence of antibiotic misuse. Misuse of an antibiotic results in incomplete elimination of bacterial infections, which, in turn, leads to survival of strains of bacteria that have evolved to resist that antibiotic. Superbugs can be dangerous because of the limited number of treatment options available. Among some of the more common superbugs are methicillin-resistant Staph aureus (MRSA) and multiple-drug or extensively drug resistant tuberculosis (MDR-TB and XDR-TB).
In an article published online in the journal Lancet Infectious Diseases today on August 11, 2010, doctors reported finding a new gene, called NDM-1. The gene alters bacteria, allowing them to become resistant to nearly all known antibiotics. It has been seen largely in E. coli bacteria, the most common cause of urinary tract infections, and on DNA structures that can be easily copied and passed onto other types of bacteria.

Dr David Livermore, one of the researchers and who works for the UK’s Health Protection Agency (HPA), said: “The NDM-1 problem is likely to get progressively worse in the foreseeable future. “The potential for wider international spread and for NDM-1 to become endemic worldwide are clear and frightening.” Infections have already been passed from patient to patient in UK hospitals. Researchers say the way to stop NDM-1 is to identify and isolate any patients who are infected.

“Hospitals need to ensure they continue to provide good infection control to prevent any spread, consider whether patients have recently been treated abroad and send samples to HPA for testing. The potential of NDM-1 to be a worldwide public health problem is great, and coordinated international surveillance is needed,” the authors wrote. Aside from the U.K., the resistant gene has also been detected in Australia, Canada, the Netherlands, the U.S. and Sweden. The researchers said that since many Americans and Europeans travel to India and Pakistan for elective procedures like cosmetic surgery, it was likely the superbug would spread worldwide.

The spread of these multi-resistant bacteria merits very close monitoring,” wrote Johann Pitout of the division of microbiology at the University of Calgary, Canada, in an accompanying commentary. Pitout called for international surveillance of the bacteria, particularly in countries that actively promote medical tourism. The consequences will be serious if family doctors have to treat infections caused by these multi-resistant bacteria on a daily basis.”

SUPERBUG VS ANTIBIOTICS
Health experts come together today (Thursday) to warn that a new form of superbug that gives bacteria the power to resist virtually all known antibiotics is spreading quickly, posing a global health disaster. It is called New Delhi metallobeta-lactamase, or NDM-1 for short. This enzyme destroys carbapenems, an important group of antibiotics used for difficult infections in hospitals, and has been found in a wide variety of bacterial types. British researchers last August reported that infections involving NDM-1 had been found in patients in Bangladesh, India, Pakistan and Britain.

This new study published Thursday in the U.K. medical publication The Lancet shows NDM-1 is widespread outside the hospital environment in Delhi, India and circulating in bacteria than inhabit drains and tap water, due to sewage contamination. The World Health Organization Thursday issued a plea for collective action to fight emerging new superbugs like the NDM-1, warning that the threat is spreading fast. Experts say the danger is acute because the pipeline of new antibiotics is essentially empty.

David Livermore, director of antibiotic resistance monitoring at the U.K.’s Health Protection Agency said in a statement, “So much of modern medicine—from gut surgery to cancer treatment, to transplants—depends on our ability to treat infection. If resistance destroys that ability then the whole edifice of modern medicine crumbles.” Over the past three decades only two new classes of antibacterial medicines have been discovered, compared to 11 in the previous 50 years. AstraZeneca PLC (AZN) Chief Executive David Brennan said in a prepared address Thursday for The WHO World Health Day, marking the founding of the Geneva-based body, “We have to recognize that even if we can increase these numbers, the task will never be complete because our most recently approved and most effective drugs will
gradually decline in efficacy and we will need to develop new antibiotics to replace them.”

Antibiotics lose their effectiveness over time, as bacteria naturally evolve and mutate, becoming resistant. And resistance is a truly global problem. In the U.S., hospital-acquired, drug-resistant bacterial infections kill 63,000 patients each year and cost $34 billion. In the E.U., multi-drug-resistant bacteria cause about 400,000 infections a year and at least 25,000 deaths, and generate costs of EUR1.5 billion, industry figures show.

“If leaders in government, science, economics, public policy, intellectual property and philanthropy can come together, we will maximize the opportunities to develop and implement the creative solutions that will truly make a difference to tackling anti-microbial resistance,” Brennan said.

“Antibiotics are a precious discovery, but we take them for granted, overuse and misuse them,” said Zsuzsanna Jakab, WHO director for Europe. “There are now superbugs that do not respond to any drug...We need to raise the alert that we are at a critical point in time where antibiotic resistance is reaching unprecedented levels, and new antibiotics are not going to arrive quickly enough.”

The UN health agency is highlighting the problem on the occasion of this year’s World Health Day. It wants governments, but also civil society and the pharmaceutical industry to come up with strategies to deal with drug resistance.

**Fig. 2: Worldwide superbug patient**

**TYPES OF SUPERBUG**

Superbugs are bacteria which are resistant to most antibiotics. There are three types of Superbugs.

- NDM-1 (New Delhi metallo-beta-lactamase-1)
- VRE (Vancomycin resistant enterococcus).
- MRSA (Methicillin-resistant staphylococcus aureus).

**Fig. 3: Mutation of bacteria**
MRSA SUPERBUG
The superbug is also known as MRSA, which stands for Methicillin-resistant Staphylococcus Aureus. It is a type of bacteria that is responsible for infections that are very difficult to treat in humans. This is because this bacteria has developed the ability to survive the treatment of such antibiotics as penicillin, methicillin and cephalosporin.

Those people who are the most susceptible to this superbug are those that are in the hospital or in a health care facility and have a weakened immune system or are using an invasive device. However, people who have an open wound, infection, abscess, boil or other type of puss-filled lesion are also susceptible to this illness. Some of the other symptoms of MRSA include cellulitis, pneumonia, fever, chills, low blood pressure, joint pain, severe headache, shortness of breath, a rash over the entire body and even death.

While Staphylococcus Aureus, sometimes simply referred to as “staph,” is a common bacterium that is found on healthy people’s skin or in their nose, it can get into the body through breaks in the skin and then cause an infection. This infection will range anywhere from boils or pimples to pneumonia and blood infections. These infections are resistant to penicillin because staph can make a substance that is known as B-Lactamase which is able to destroy the antibacterial activity of penicillin.

Most recently, there has been a new strain of MRSA identified by scientists. This strain is resistant to most of the treatments that had previously worked. Investigators are finding that the infections that are resulting from this new strain of the superbug are primarily linked to high-risk behaviors. These behaviors include such things as drug use, sex with multiple partners and a history of sexually transmitted diseases.

SYMPTOMS OF SUPERBUG
There are many forms of MRSA in existence today. It is important to be properly diagnosed to see which type you have before any treatment may begin. However, this needs to be done as soon as possible to prevent this illness from growing worse. This is highly important considering...
that people have actually died due to this illness not being able to be cured. The most common way in which a MRSA infection starts is as a skin infection, in the form of either an abscess or a boil. This may look like small red bumps resembling pimples or like a spider bite. However, these can quickly become deep, painful abscesses that must be surgically drained. Along with this skin issue you may also get flu-like symptoms, which include a high fever and sweating. If left untreated, MRSA can burrow deeper into your body and cause potentially life-threatening infections in your bones, joints, bloodstream, heart valves or lungs.

MRSA can also show up as a urinary tract infection. In the worst case, MRSA may actually enter into your lungs and cause you to have pneumonia, which includes a high fever and difficulty with breathing. As you can clearly see, some of these symptoms are so subtle that they may actually be missed upon first glance. However, the symptoms also depend upon where your infection is located.

Other signs and symptoms of MRSA include
1. A superficial skin infection that has a honey-colored crust and blisters.
2. A Pus like infection in your hair follicles.
3. A collection of pus under your skin that is red, hot to the touch, swollen and tender. (This is most commonly known as an abscess.)
4. An infection that is larger area than an abscess and has several openings.
5. An infection in your soft tissue that may start as what may look like a pimple or bug bite but then become hot to the touch, red, swollen and tender.
6. A sty, which is simply an infection of the eyelids.

If it is a serious case of MRSA, then these signs and symptoms may be present
1. Low blood pressure
2. Joint Pain
3. headaches
4. Shortness of breath
5. Rash on body
6. Chest pain
7. Fatigue
8. Muscle aches
9. Generally feeling ill

MRSA can become serious in just a very short amount of time. Therefore, seeing your doctor may just end up saving your life⁴.
When a wound is not cleansed or an infection is not treated, a MRSA infection can spread to others and to other parts of the body. Diagnosing the superbug early will reduce the risks of the infection spreading. Treatment includes identifying the specific strain of MRSA bacteria so that the most successful antibiotic regimen can be used to treat the infection.

**Antibiotics used for MRSA**

Most antibiotics aren’t successful in treating and killing MRSA, the superbug. The antibiotics that are used include vancomycin (Vancocin), linezolid (Zyvox), trimethoprim-sulfamethoxazole (Bactrim) doxycycline (Vibramycin), clindamycin (Cleocin) and others. For an antibiotic to be successful, the specific strain of MRSA must be determined through tests. The tests can be done using cultures, blood samples, tissue samples, or from the MRSA DNA that is present in the blood. Identifying the bacterium from DNA is the fastest the most common method.

Some superbugs are becoming resistant to current treatments. The medical community is taking precautions to avoid the wide spread of VRSA (vancomycin-resistant *staphylococcus aureus*) and it’s quickly becoming the next superbug we will have to battle.

**Additional treatments for MRSA, the superbug**

When proper wound care isn’t successful in treating the superbug, MRSA, in addition to antibiotics, the treatment for MRSA, the superbug includes creating an incision in the abscess and draining it. Sometimes if there is tissue damage, it may have to be removed. During treatment, the infection is kept covered and anyone who is in contact with the patient should be sure they aren’t to spread the MRSA to others or become infected with the superbug themselves by following infection control/prevention procedure.

For severe cases of MRSA, treatment can include hospitalization and other treatment. When the infection has spread to the heart, lungs, or other organs the treatment will need to include treating any damage to the organs that may have occurred as a result of the infection. As with most illnesses and infections prompt diagnosis is important to starting treatment early, which will increase the success of treatment and reduce the risk of MRSA (methicillin-resistant *staphylococcus aureus*), the superbug from spreading.

There are lots of questions today in regards to the super bug. People are hearing a lot about it but there is still much more they would like to learn to help them have the best chance of preventing infection. It is with this in mind that this article is being written. Listed here are some of the most common questions about this illness.

**Where can MRSA superbug be found on the body?**

It can be found in your nose, blood, urine or on your skin.

**How Does MRSA Superbug Spread?**

There are a number of things that you can do to keep from getting this superbug, including:

1. Practice good hygiene.
2. Keep any skin abrasions or cuts covered with a clean, dry bandage until they are healed.
3. Do not share personal items.

**When should you seek medical attention?**

Minor skin problems that become infected or show signs of getting worse should be seen by your doctor.

**How is MRSA diagnosed?**

Infections are diagnosed by a doctor who obtains a sample of the infected site and then sends the sample to a laboratory that
cultures it. The lab will also conduct tests using various antibiotics to see whether or not the bacteria is resistant to them and find out which antibiotic is best for the particular strain of MRSA.

**NDM-1 Superbug**

NDM-1 stands for *New Delhi metallo-beta-lactamase*, which is an enzyme produced by certain strains of bacteria that have recently acquired the genetic ability to make this compound. The enzyme is active against other compounds that contain a chemical structure known as a beta-lactam ring. Unfortunately, many antibiotics contain this ring, including the penicillins, cephalosporins, and the carbapenems.

![Fig. 7: NDM-1 Superbug bacteria](image)

There are many types of beta-lactamases. Most are only active against older beta-lactam antibiotics but are not active against newer agents like the carbapenems. However, bacteria that produce NDM-1 are resistant to all commonly used beta-lactam antibiotics, including carbapenems. Some antibiotics like aminoglycosides and fluoroquinolones do not contain beta-lactam rings. Unfortunately, the bacteria that have acquired NDM-1 have also acquired other resistance factors and most are already resistant to aminoglycosides and fluoroquinolones. The addition of NDM-1 production has the ability to turn these bacteria into true superbugs (bacteria resistant to usually two or more antibiotics) which are resistant to virtually all commonly used antibiotics.

NDM-1 infection was first identified (in 2009) in people who resided in or traveled to the India and Pakistan. Antibiotic use in India is not as restricted as it is in the United States and some researchers feel overuse of carbapenems allowed NDM-1 to develop. Others point to the advent of medical tourism as a cause of NDM-1 spread among countries. Medical tourism refers to patients who travel to a country to get medical care that is not available or is more expensive in their own country. The three first cases of NDM-1 infection in the United States were identified in June 2010 in Americans who had recently sought medical care in India. Vacation and business travel have also played a role in introducing NDM-1 bacteria into countries outside of the Indian subcontinent. Cases have now been detected in many countries, including Great Britain, Canada, Sweden, Australia, Japan, and the United States.

NDM-1 is a newly identified problem, only recognized since about December 2009 in the medical literature. To date, there have fewer than 100 cases identified outside of the Indian subcontinent, so this is not a pandemic like bird flu or swine flu. However, the number of cases is growing and the concern is that these highly resistant bacteria could supplant more antibiotic-sensitive strains. If this happens, the antibiotic arsenal that has been built up over the last 80 years will be seriously compromised.

![Fig. 8 New superbug in UK](image)
What causes NDM-1 to be produced in bacteria?
The gene that encodes for NDM-1 is called \( \text{bla}_{\text{NDM-1}} \) and has been identified on bacterial chromosomes and plasmids. Plasmids are small segments of genetic material that are easily transferred among bacteria. In this way, the ability to produce NDM-1 can pass from one bacterial strain to another and even from one bacterial genus to another.

Cases of NDM-1 infection are usually caused by gram negative bacteria from the Enterobacteriaceae family. This family includes common bacteria like Escherichia coli (E. coli) and Klebsiella. These bacteria reside in the bowel and may spread from person to person if hands or items are contaminated with fecal material. To date, strains of Klebsiella, Escherichia, and Acinetobacter genera of bacteria are known to possess the gene for NDM-1.

**NDM-1 Symptoms – Superbug Symptoms**

Scientists have found the NDM-1 Superbug in Delhi drinking water. Experts are now referring to the NDM 1 gene, as “super superbugs.” Read more about NDM-1, ESBL and Carbapenemases and this Gram-negative bacteria. Three people who returned to the US from India earlier this year have been found to be infected by this superbug. NDM-1 is highly resistant to antibiotics as told by the US Centres for Diseases Control and Prevention. The three patients from Massachusetts, California, and Illinois were confirmed with the 2011 superbug after receiving medical care in India. Currently, the superbug has been detected in 29 countries worldwide – this includes Canada. The NDM 1 bacteria is a newly-identified supergene that is spreading globally. NDM-1 stands for “New Delhi metallo-beta-lactamase” or New Delhi-Metallo-1 (NDM-1) named after the capital city of India, where it was first identified. The Indian supergene is antibiotic-resistant and has the potential to become more devastating than the H1N1 Pandemic. NDM1 makes bacteria extremely resistant to almost all antibiotics, including the most potent class called carbapenems. Similar to the California Superbug, NDM-1 is Carbapenem-resistant. CRKP, is short for Carbapenem-resistant Klebsiella pneumoniae.

**NDM-1 Transmission and NDM-1 Prevention**

NDM-1 KPC Carbapenemases emerged, on the heels of WHO announcing that H1N1 Swine Flu pandemic was finally over. Media reports have indicated that many patients pick up the antibiotic-resistant supergene after seeking medical treatments abroad. Patients frequently travel to India in an attempt to find affordable healthcare. Medical Tourism in India is said to be the source of the supergene NDM-1.

NDM1 deaths are rising and do is global fear. Scientists claim that they have lost the war on antibiotic-resistant supergenes.

**Symptoms of NDM-1 - Superbug 2011**

Symptoms of the NDM-1 supergene include fever, pneumonia, wound infections or urinary tract infections. Similar to the California Superbug symptoms, the NDM 1 enzyme can lead to pneumonia, urinary tract infections, and blood infections. Health officials have revealed that the NDM 1 Bacteria is spread in person-to-person contact.

**E. Coli symptoms**
- Diarrhea
- Abdominal cramps
- Nausea
- Fatigue

**Klebsiella pneumonia symptoms**
- Fever
- Chills
- Cough
- Dizziness
- Wheezing
- Urinary tract and wound infections

**NDM 1 high risk groups include**
- Those who have recently been to India or Pakistan
• Those who have been in contact with someone who has recently traveled to India or Pakistan
• Those who have weakened immune systems

NDM-1 Facts
• **E. Coli**: NDM-1 gene has been found inside the E. Coli bacteria
• **Klebsiella Pneumoniae**: Known as a bacteria hosting NDM-1
• **Common symptoms**: Urinary tract infections, blood infections, diarrhea
• **Bacteremia**: Means bacteria in blood, may lead to blood infections or sepsis.

The NDM 1 enzyme is especially prevalent in patients who went to India or Pakistan which are popular destinations for cosmetic surgery procedures. The NDM-1 concern has reached a global level because of medical tourism and international travel. The NDM-1 superbug has the potential to go global quickly.

- **Fig. 9**: Infection of NDM-1 Superbug

How are bacteria that produce NDM-1 identified?
It is standard practice to test bacteria for sensitivity to antibiotics. Strains that produce NDM-1 will show resistance to penicillins, cephalosporins, and carbapenems. Because carbapenem resistance is still relatively rare, resistance to these agents should raise suspicion of NDM-1, although not all of these resistant strains will be NDM-1 strains. If the patient has recently been to an area where NDM-1 is common, like India or Pakistan, this increases the probability that the strain is producing NDM-1.

Specific testing for NDM-1 is not routinely available in clinical laboratories. Fortunately, it is not necessary to determine if carbapenem resistance is specifically due to NDM-1 because treatment is guided by the antibiotic sensitivity testing. If a carbapenem-resistant isolate is recovered from a patient who has received medical care in India or Pakistan, it should be sent to a state public-health laboratory, which will forward it to the Centers for Disease Control and Prevention for specific testing for NDM-1. Patients who have bacteria isolated from their infective site that produce NDM-1 are then definitively diagnosed as having an infection caused by bacteria that produce NDM-1.

Treatment for an NDM-1
Treatment is guided by the antibiotic resistance pattern. Many NDM-1 strains are resistant to all antibiotics except for colistin. Colistin is an older antibiotic that has not been used much in recent decades, because it is somewhat more toxic than other antibiotics. A few NDM-1 strains have been sensitive to *tigecycline* (Tygacil), but this agent should be used cautiously in serious infections because it does not achieve high levels in the bloodstream. A few strains have also been sensitive to aztreonam, although the U.S. strains were not. Researchers have identified a new antibiotic compound that may inhibit NDM-1 containing bacterial topoisomerase function so the bacterial replication is inhibited or stopped. Unfortunately, the compound has not gone through any clinical trials and is not commercially available.
What is the prognosis for a person infected with NDM-1 producing bacteria?
NDM-1 infections can be successfully treated if they are identified early and if colistin or other appropriate agents are used promptly. As stated above, antibiotic sensitivity testing is standard in clinical laboratories and can be used to identify carbapenem-resistant strains and to guide antibiotic therapy. However, antibiotic sensitivity testing usually takes two days because the bacteria must be cultured in the laboratory.

Can infections with bacteria containing NDM-1 be prevented?
The risk of person-to-person spread of NDM-1 infection can be reduced by practicing good hand hygiene. This includes washing or disinfecting hands after using the bathroom and before preparing food. In hospitals, patients with suspected NDM-1 infections should be placed in a private room and cover gowns and gloves should be used by health-care personnel. Other barrier methods should be used if contamination is likely (for example, eye protection if splashing is possible). Strict hand hygiene should be observed. Hospitals should ensure that their laboratories are equipped to test for carbapenem resistance and hospital infection-control programs should review resistance patterns regularly. To reduce the risk that NDM-1 will develop in bacteria, it is important to use existing antibiotics wisely. Carbapenem antibiotics should only be used when bacteria are resistant to older agents. Antibiotics should always be dosed appropriately.

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Vancomycin-Resistant Enterococci (VRE)
Enterococci are bacteria that are commonly found in the human digestive tract and female genital tract, but do not pose a threat to healthy people. Infections occur more commonly in people who are in hospitals or other healthcare facilities and who may be more susceptible to infection. Healthcare providers commonly use the antibiotic vancomycin to treat infections, but upon exposure, some bacteria will develop or acquire resistance to vancomycin.
Transmission
VRE is transmitted from person to person most commonly by healthcare workers whose hands have inadvertently become contaminated, either from feces, urine, or blood of a person carrying the organism. It can also be spread indirectly via hand contact with open wounds or by touching contaminated environmental surfaces, where the bacterium can survive for weeks. VRE is not transmitted through the air.

Of more than a dozen forms of enterococci bacteria, two are the primary concern for human disease: *E. faecium* and *E. faecalis*. *E. faecium* is the most frequent species of VRE found in hospitals.

Diagnosis
*Enterococci* have two types of resistance to vancomycin: acquired and intrinsic (natural). Some types of *enterococci* bacteria acquire the resistance when other bacteria come in contact with *enterococci* and share genetic information—scientists believe *enterococci* acquired the gene that resists vancomycin from bacteria in the digestive tract. Acquired resistance has been noted with two clinically important forms of *enterococci*: *E. faecium* and *E. faecalis*.

Of the dozen or so types of *enterococci* bacteria, some, such as *E. gallinarum* and *E. casseliflavus*, have an inherent, low-level resistance to vancomycin. These are very uncommon strains, however, and are of limited clinical significance.

If you have an enterococcal infection, it is crucial that your healthcare providers quickly identify the strain, so that they can determine how best to treat you and prevent patient-to-patient transmission. They will want to know if the strain infecting you is resistant to vancomycin, and if so, is the resistance intrinsic or acquired? If the resistance is acquired, does the strain contain specific genes that can share resistance traits with other bacteria, thus making it able to spread disease?

Tests are available to make those diagnoses.

Some healthcare practitioners, as part of their normal infection control procedures, will test you for the presence of VRE to learn whether you might be infected or colonized with the bacterium. This helps facilities know whether specific procedures should be used to reduce the potential spread of VRE.

Treatment
Most VRE infections can be treated with antibiotics other than vancomycin. Some of the antibiotics that fail to work because of intrinsic resistance include some types of penicillin, cephalosporins, clindamycin, and aminoglycosides. Treatments that are ineffective because of acquired resistance include vancomycin, some penicillins, macrolides (such as erythromycin), tetracycline, quinolones, and others.

The course of treatment is determined by testing different antibiotics in the laboratory to determine which ones might be most effective against the infectious strain. If you develop a VRE infection and have a urinary catheter, sometimes removing the catheter will clear the infection.

If you are colonized with VRE—the bacteria are present but have not caused an infection—you usually will not require treatment.

Prevention
Proper hand hygiene—thorough washing with soap and then drying—is the best way to prevent the spread of *enterococci*.

The CDC Hospital Infection Control Program encourages hospitals to develop their own institution-specific plans, which should stress:

- Prudent vancomycin use by clinicians
- Hospital staff education regarding vancomycin resistance
- Early detection and prompt reporting of vancomycin resistance in enterococci and other gram-positive microorganisms by the hospital microbiology laboratory
- Immediate implementation of appropriate infection control
Aromatherapy oils could kill superbug

Benchmark Thyme rapidly killed MRSA. Maggie said: "What is interesting is that the thyme oil we use is food grade, and in preliminary company trials shows no adverse effects on intact skin."

The MRSA bacteria is often carried on the skin or in the nostrils of healthy people but when a carrier enters hospital for an operation or any procedure that punctures the skin, bacteria can enter the body causing serious medical problems, and each year up to 5,000 people die as a result.

The research was published in the International Journal of Essential Oil Therapeutics and was carried out by a team of microbiologists led by Professor Geoff Hanlon. Benchmark Oils is now looking for partners in order to take the research further.

CONCLUSION

The life threatening disease superbug is now spread more rapidly, when the person who infect with bacterial infection that immediately consult the doctor for accurate therapeutic that is antibiotic. The patient should not cut or do not stop the dosage before complete treatment. The scientist discover the new molecule for stoppage of natural multiplication of bacteria. The recently discover Aromatherapy oils could kill superbug. So treat the bacterial infection cautiously & avoid misuse of antibiotic.

REFERENCES

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